A Partnership to Protect Firefighter and Public Health, Baseline Fuels Reduction, and Enhance Ecosystem Restoration Research Partnership

Six organizations formed a Management-Research partnership to protect firefighter and public health through improved smoke monitoring, modeling and management, to establish a baseline for fuels reduction accountability, and to enhance longleaf fire savanna community restoration. Collaboration was critical because of the complexity of the problem. The USDA Forest Service-Savannah River (USFS-SR), Southern Research Station-Smoke Management Team (Athens) and Forest Inventory & Analysis (Asheville), University of Georgia School of Public Health, the Pacific Northwest Forest Experiment Station-Wildland Fire Laboratory (Seattle), and the Westinghouse Savannah River Company worked together, acquired additional resources and expertise, and worked with regulators and interested publics.

The USFS-SR manages the natural resources of the Savannah River Site (~200,000 ac). Prescribed fire is a critical strategy to achieve ecological restoration of the endangered red-cockaded woodpecker habitat and fuels reduction. The complexities of the Site infrastructure, security, safety standards, and missions, coupled with air quality issues and the wildland urban interface, makes implementation of prescribed fire a major challenge. The wildfire damage at Los Alamos, NM in 2000 greatly increased concerns. Sustaining or increasing prescribed fire while protecting communities and firefighters required improved models and methods for forecasting weather, modeling smoke dispersion, monitoring actual $PM_{2.5}$ levels downwind and inhalation by firefighters, establishing a baseline for fuels management, measuring impacts of fire on fuels, and estimating radiological emissions. Prioritizing fire treatments and identifying alternative fuels management was also important where prescribed fire was not feasible.

The partnership improved prescribed fire management, ecological restoration and wood based bio-energy production. In 2005, the USFS-SR was able to increase prescribed burning by over 50% from the previous 10-year average. New methods for monitoring smoke emissions and data for estimating public and firefighter health impacts were developed. A new model (DAYSMOKE) of smoke dispersion ($PM_{2.5}$) was created. A new inventory provided a baseline for fuels reduction accountability, equations to predict loading as a function of various stand variables and prescribed fire characteristics, and empirical data supporting the critical importance of frequent burning to reduce fuels. Fuel component inventory and projection allowed various companies to assess wood-based bio-energy power generation opportunities, leading to a proposal to replace the current coal based system with a wood-based system. The research also prioritized alternative fuels management harvests to reduce residues and ladder fuels in smoke sensitive areas. In conjunction with the 2005 Natural Resource Management Plan, the USFS-SR increased the prescribed burning goal and re-allocated prescribed fire priorities to ecologically important areas, and the wildland urban interface. The partnership leveraged numerous individual and organizational resources to successfully address a scientifically, technically, logistically and socially complex problem.